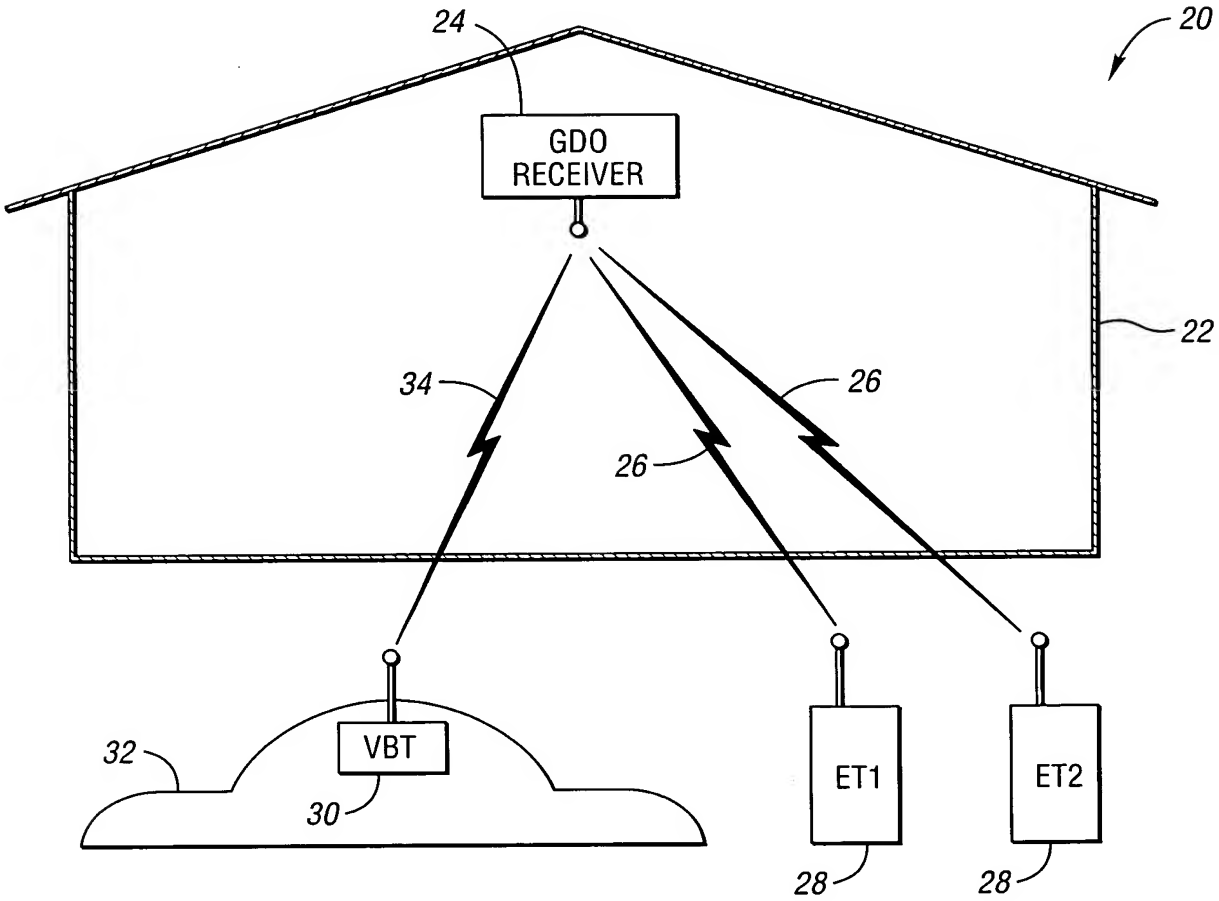


Fig. 1

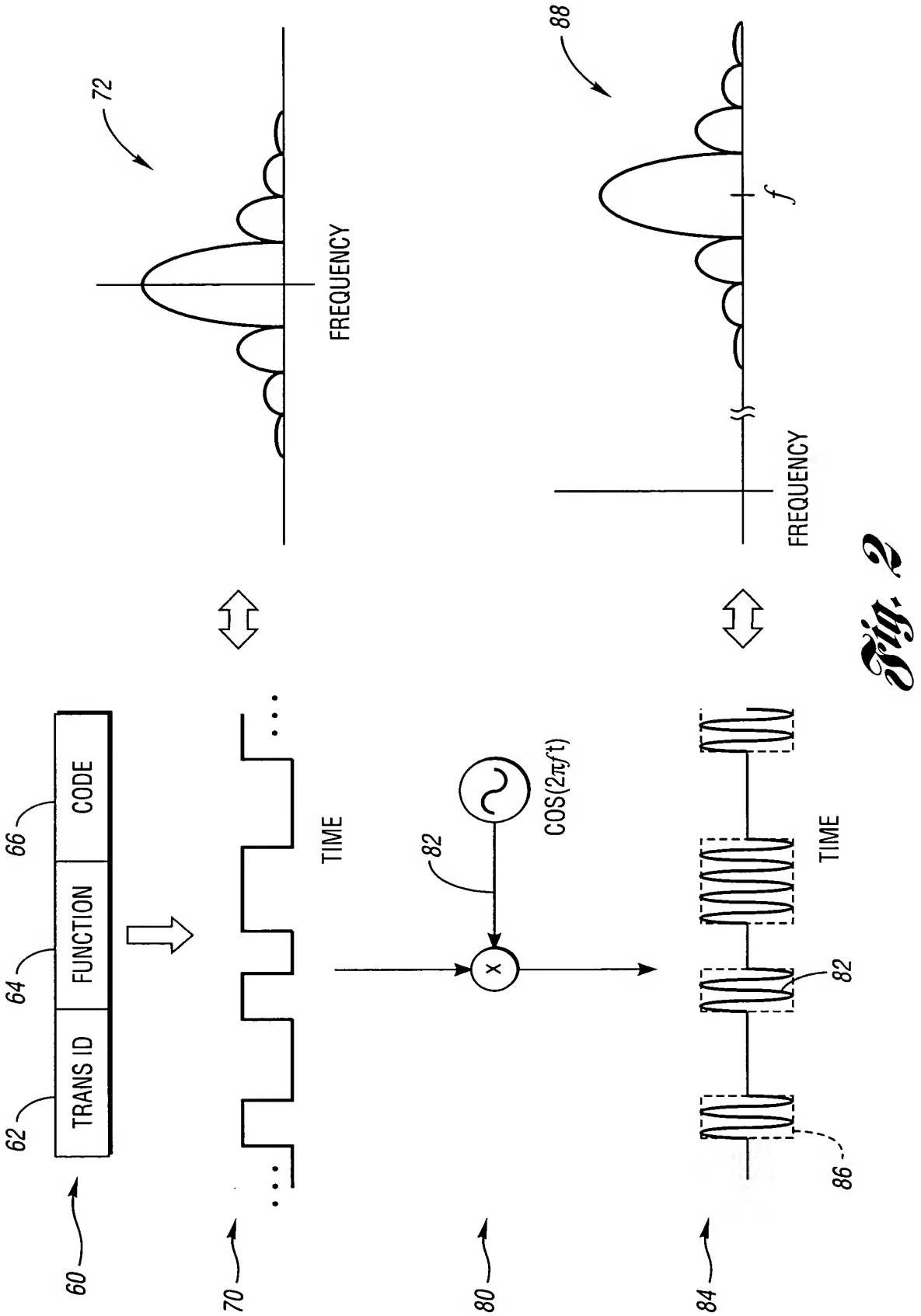

72
FREQUENCY
88
f
FREQUENCY
CODE
FUNCTION
TRANS ID
66
64
62
60
TIME
70
82
COS(2πft)
80
TIME
82
86
84

Fig. 2

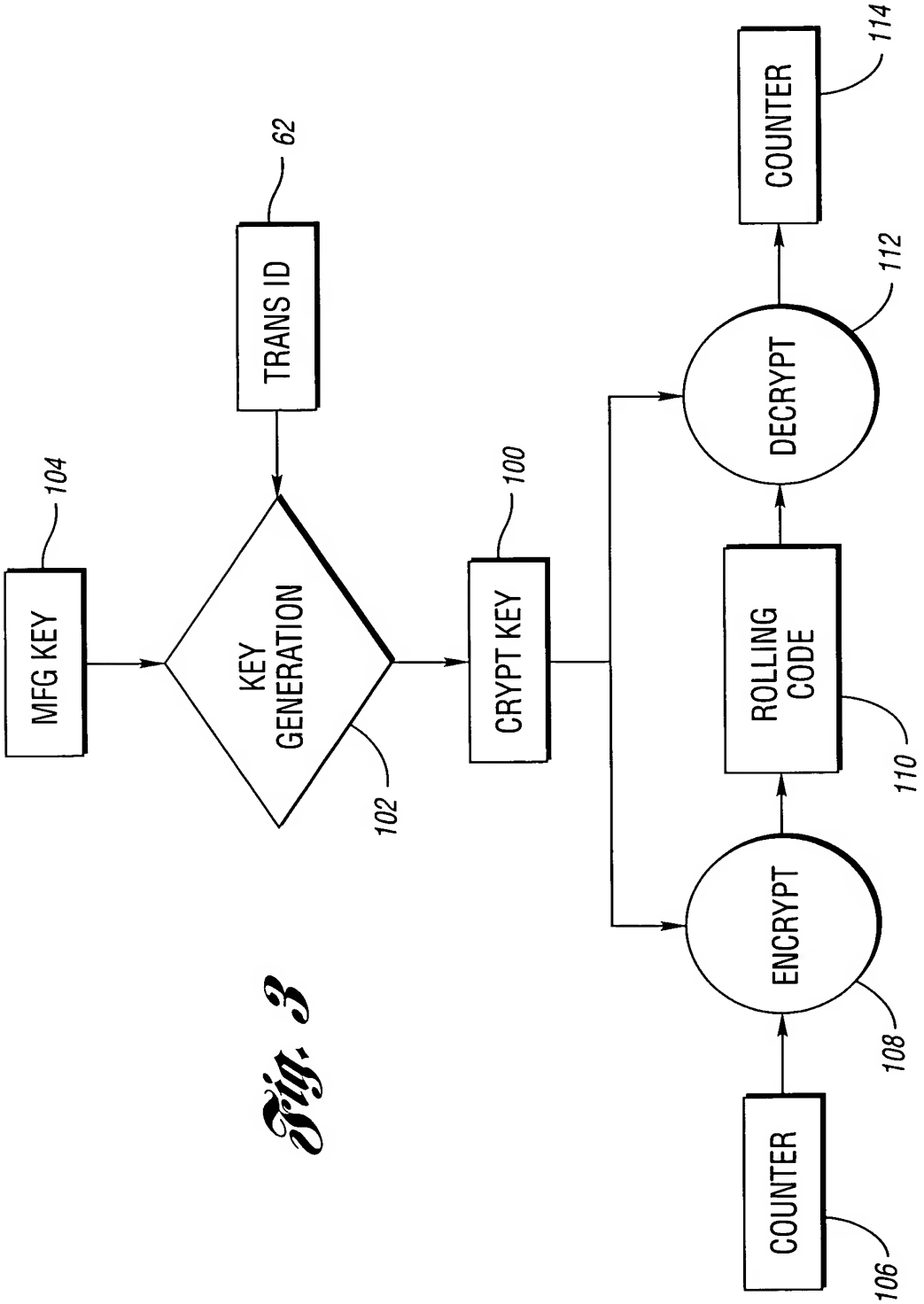

MFG KEY
104
TRANS ID
62
KEY GENERATION
102
CRYPT KEY
100
COUNTER
114
DECRYPT
112
ROLLING CODE
110
ENCRYPT
108
COUNTER
106

Fig. 3

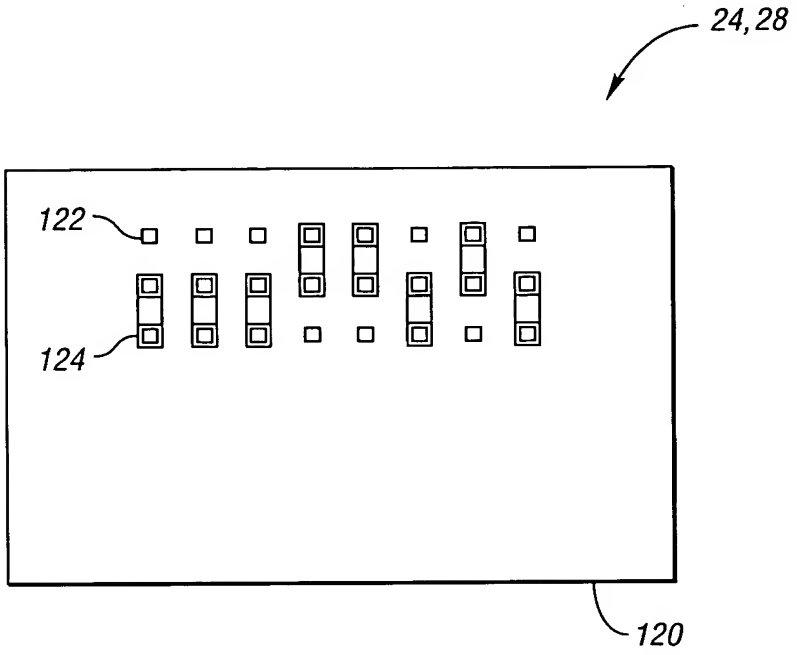

24,28
122
124
120

Fig. 4

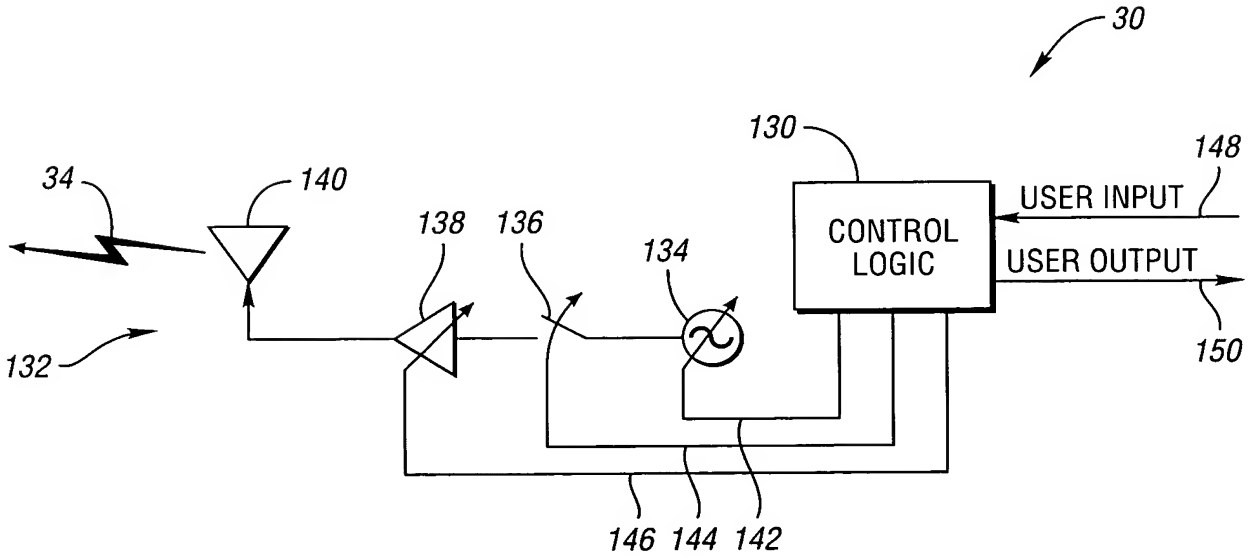

30
130
148
34
140
138
136
134
CONTROL LOGIC
USER INPUT
USER OUTPUT
132
150
146
144
142

Fig. 5

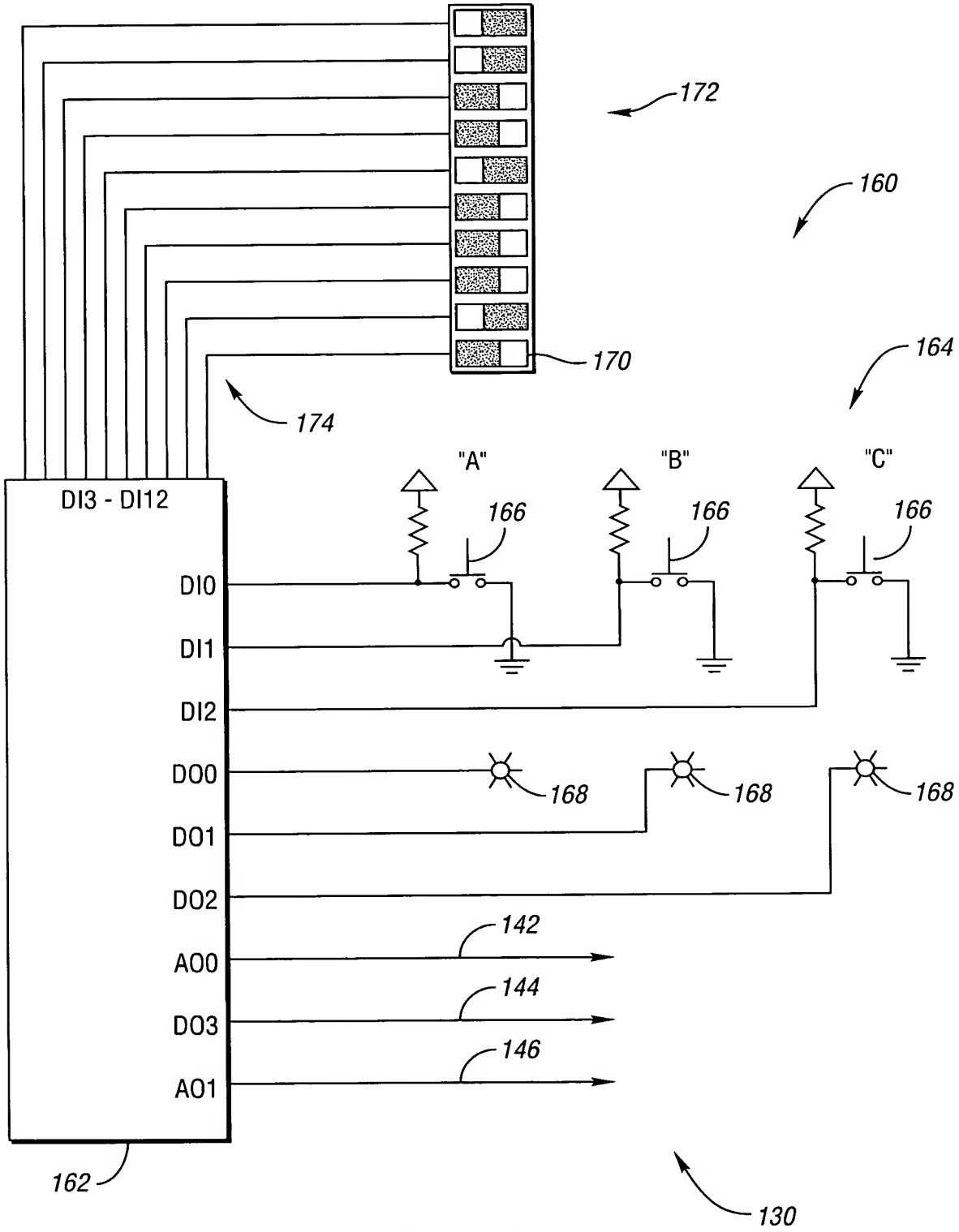

172
160
164
170
174
"A"
"B"
"C"
166
166
166
DI3 - DI12
DI0
DI1
DI2
DO0
DO1
DO2
AO0
DO3
AO1
168
168
168
142
144
146
162
130

Fig. 6

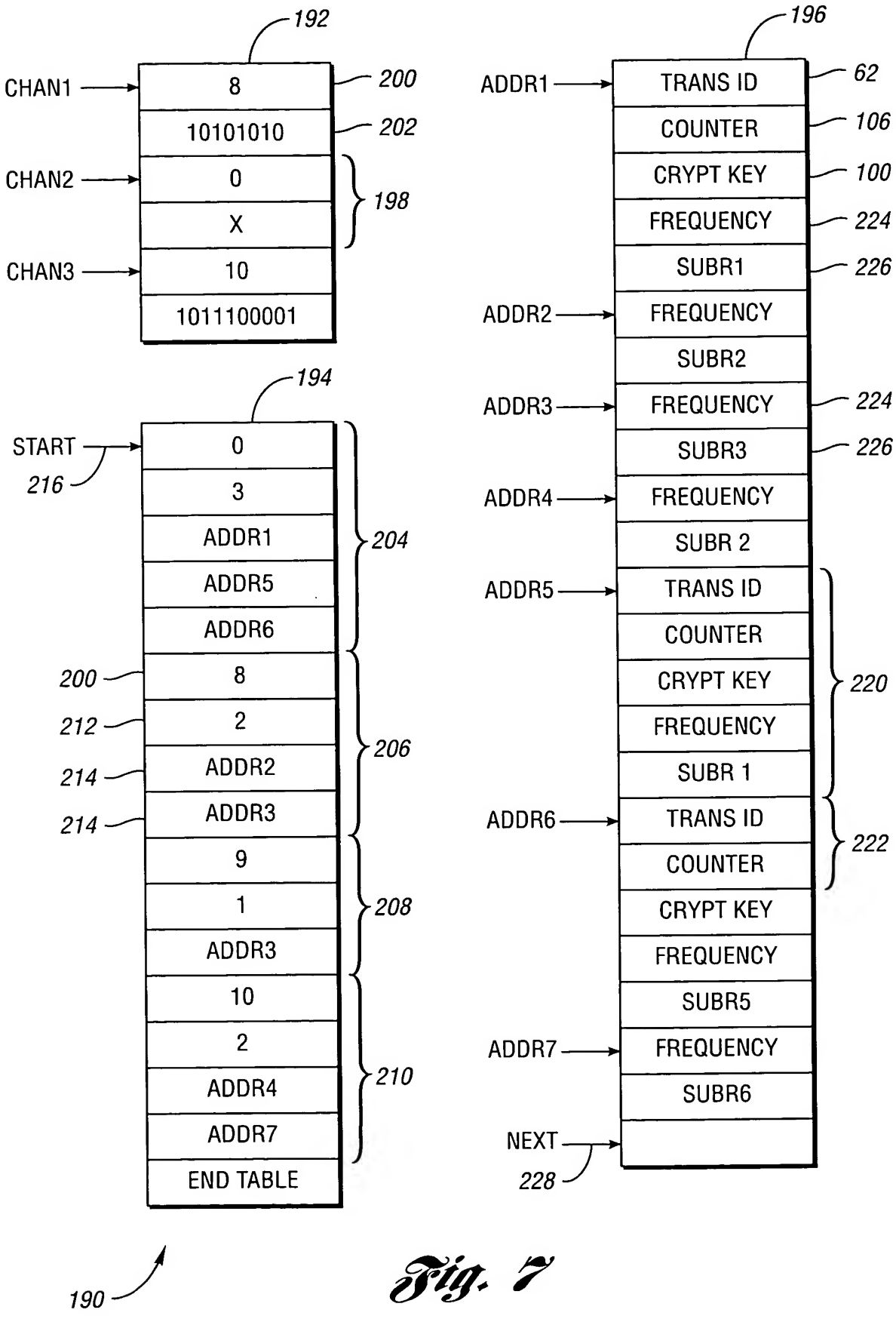

192
CHAN1
8
200
10101010
202
CHAN2
0
198
X
CHAN3
10
1011100001
194
START
216
0
3
ADDR1
ADDR5
ADDR6
204
200
8
212
2
214
ADDR2
214
ADDR3
206
9
1
ADDR3
208
10
2
ADDR4
ADDR7
END TABLE
210
196
ADDR1
TRANS ID
62
COUNTER
106
CRYPT KEY
100
FREQUENCY
224
SUBR1
226
ADDR2
FREQUENCY
SUBR2
ADDR3
FREQUENCY
224
SUBR3
226
ADDR4
FREQUENCY
SUBR 2
ADDR5
TRANS ID
COUNTER
CRYPT KEY
220
FREQUENCY
SUBR 1
ADDR6
TRANS ID
222
COUNTER
CRYPT KEY
FREQUENCY
SUBR5
ADDR7
FREQUENCY
SUBR6
NEXT
228
190

Fig. 7

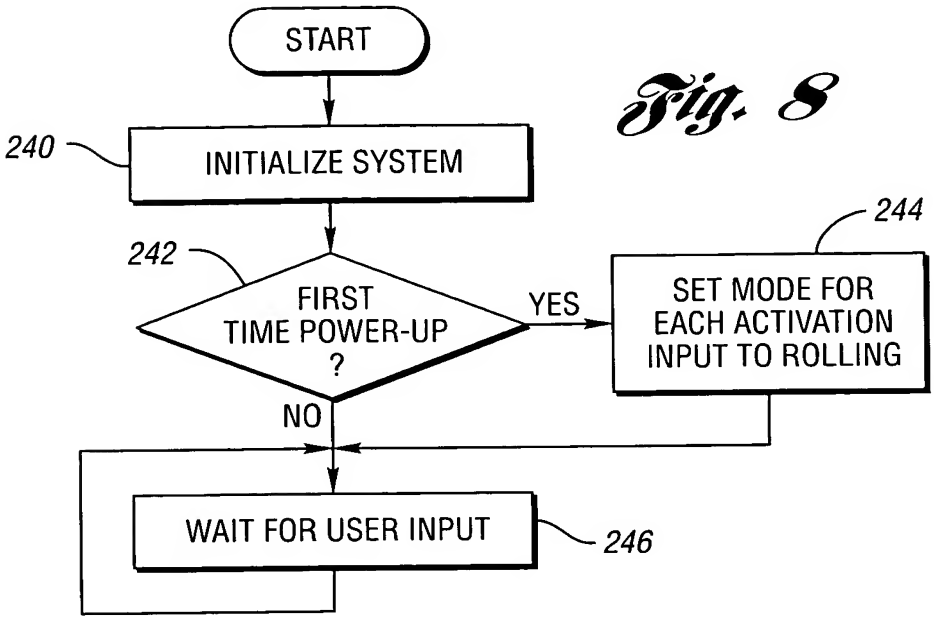

START
240
INITIALIZE SYSTEM
242
FIRST TIME POWER-UP ?
YES
244
SET MODE FOR EACH ACTIVATION INPUT TO ROLLING
NO
WAIT FOR USER INPUT
246

Fig. 8

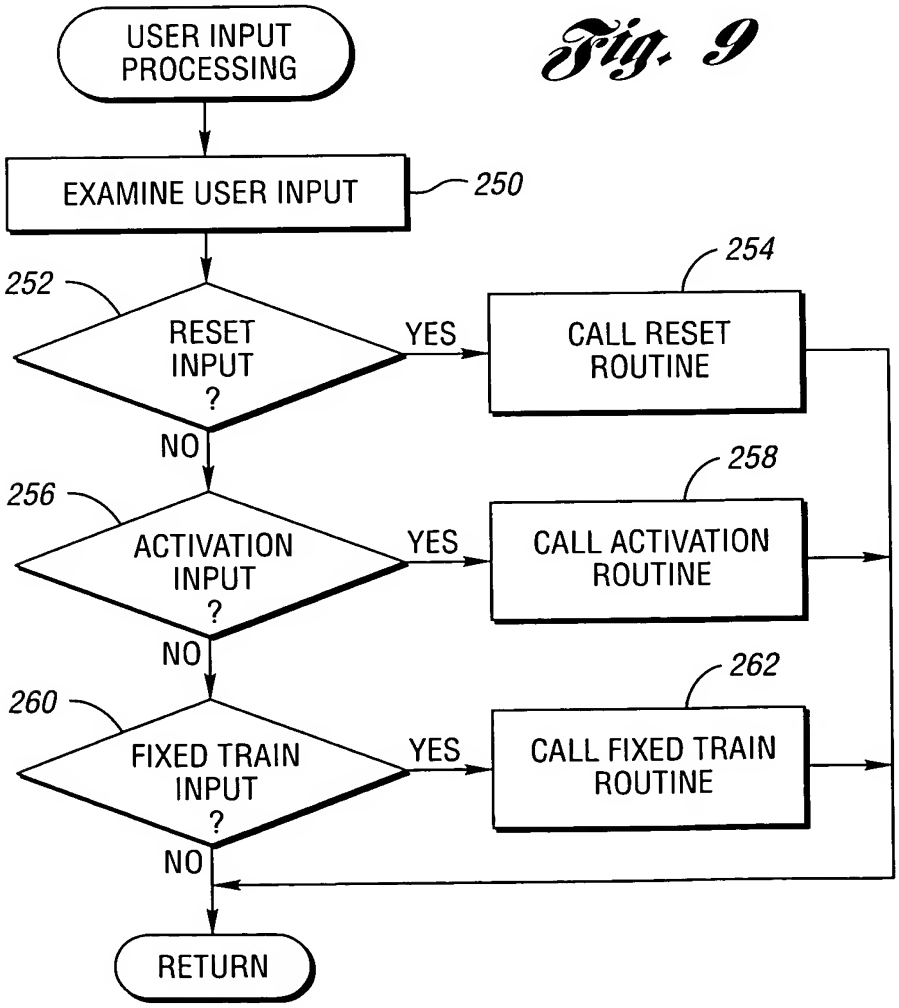
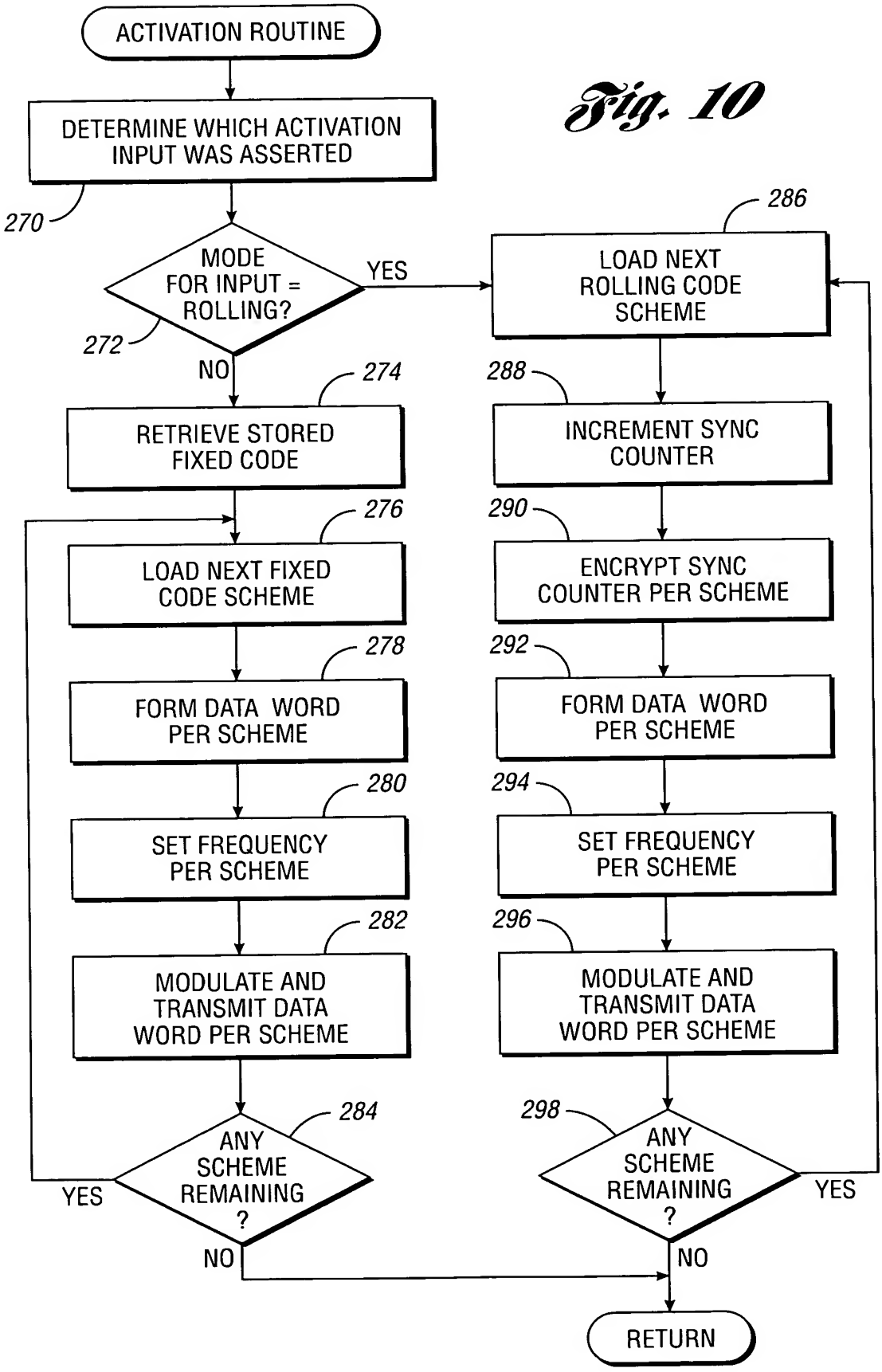

USER INPUT PROCESSING
EXAMINE USER INPUT
250
252
RESET INPUT ?
YES
254
CALL RESET ROUTINE
NO
256
ACTIVATION INPUT ?
YES
258
CALL ACTIVATION ROUTINE
NO
260
FIXED TRAIN INPUT ?
YES
262
CALL FIXED TRAIN ROUTINE
NO
RETURN

Fig. 9

Fig. 10


ACTIVATION ROUTINE
DETERMINE WHICH ACTIVATION INPUT WAS ASSERTED
270
MODE FOR INPUT = ROLLING?
272
YES
NO
286
LOAD NEXT ROLLING CODE SCHEME
288
INCREMENT SYNC COUNTER
290
ENCRYPT SYNC COUNTER PER SCHEME
292
FORM DATA WORD PER SCHEME
294
SET FREQUENCY PER SCHEME
296
MODULATE AND TRANSMIT DATA WORD PER SCHEME
298
ANY SCHEME REMAINING ?
YES
NO
274
RETRIEVE STORED FIXED CODE
276
LOAD NEXT FIXED CODE SCHEME
278
FORM DATA WORD PER SCHEME
280
SET FREQUENCY PER SCHEME
282
MODULATE AND TRANSMIT DATA WORD PER SCHEME
284
ANY SCHEME REMAINING ?
YES
NO
RETURN

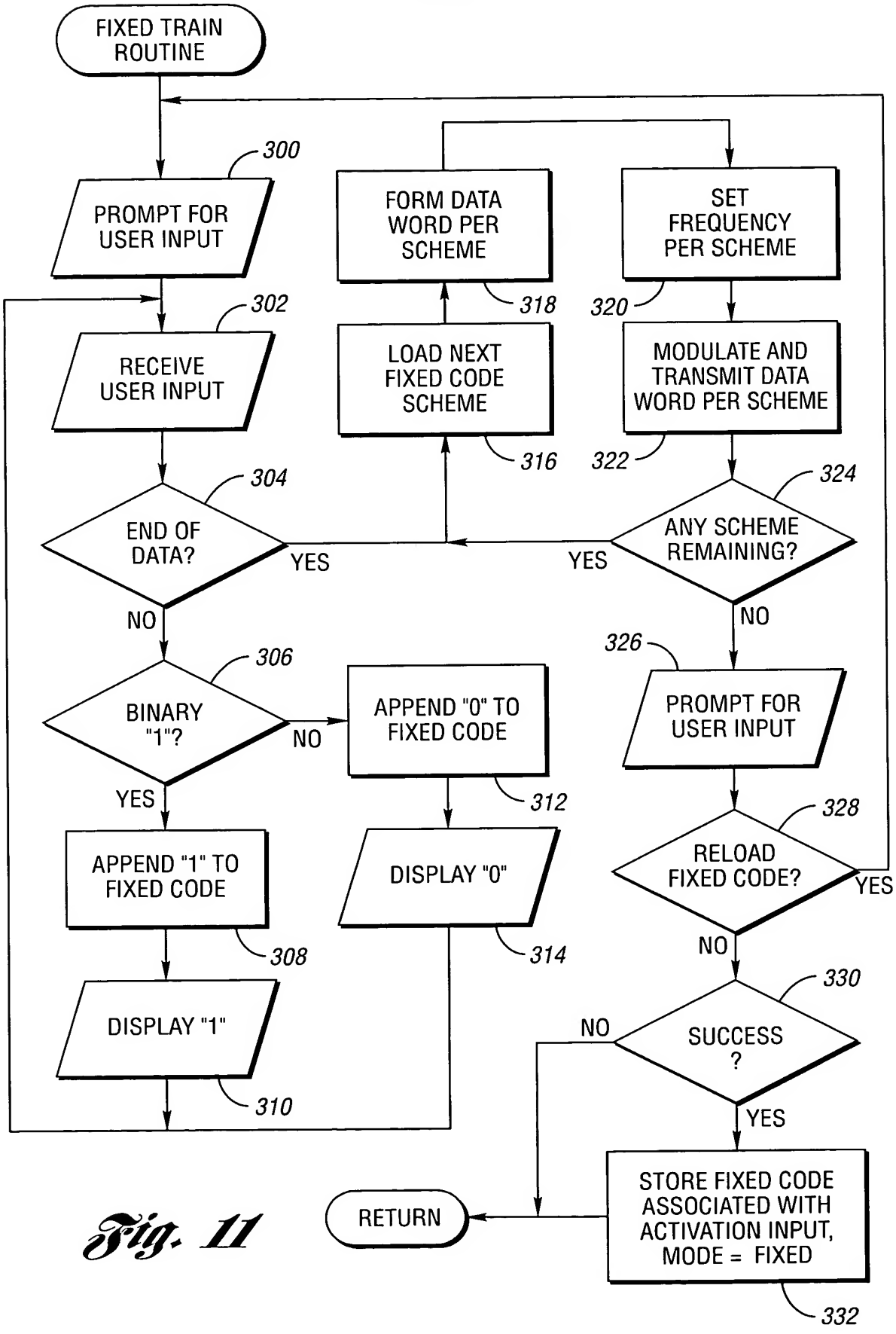

FIXED TRAIN ROUTINE
300
PROMPT FOR USER INPUT
302
RECEIVE USER INPUT
304
END OF DATA?
YES
NO
306
BINARY "1"?
NO
YES
APPEND "1" TO FIXED CODE
308
DISPLAY "1"
310
APPEND "0" TO FIXED CODE
312
DISPLAY "0"
314
FORM DATA WORD PER SCHEME
318
LOAD NEXT FIXED CODE SCHEME
316
SET FREQUENCY PER SCHEME
320
MODULATE AND TRANSMIT DATA WORD PER SCHEME
322
ANY SCHEME REMAINING?
324
YES
NO
326
PROMPT FOR USER INPUT
328
RELOAD FIXED CODE?
YES
NO
330
SUCCESS ?
NO
YES
STORE FIXED CODE ASSOCIATED WITH ACTIVATION INPUT, MODE = FIXED
332
RETURN

Fig. 11

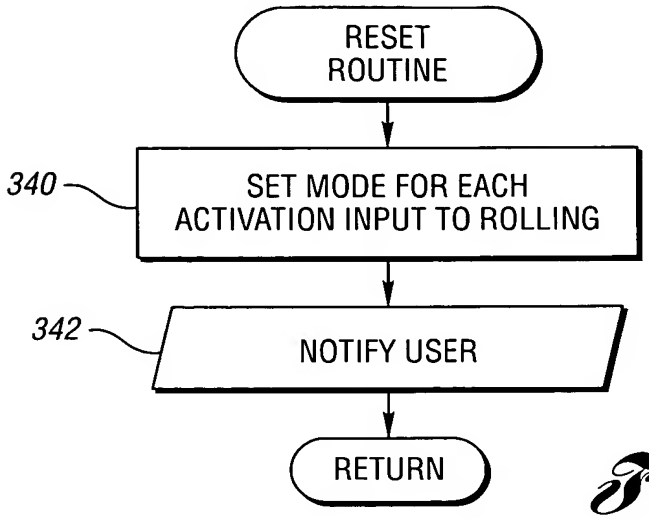

RESET ROUTINE
340
SET MODE FOR EACH ACTIVATION INPUT TO ROLLING
342
NOTIFY USER
RETURN

Fig. 12

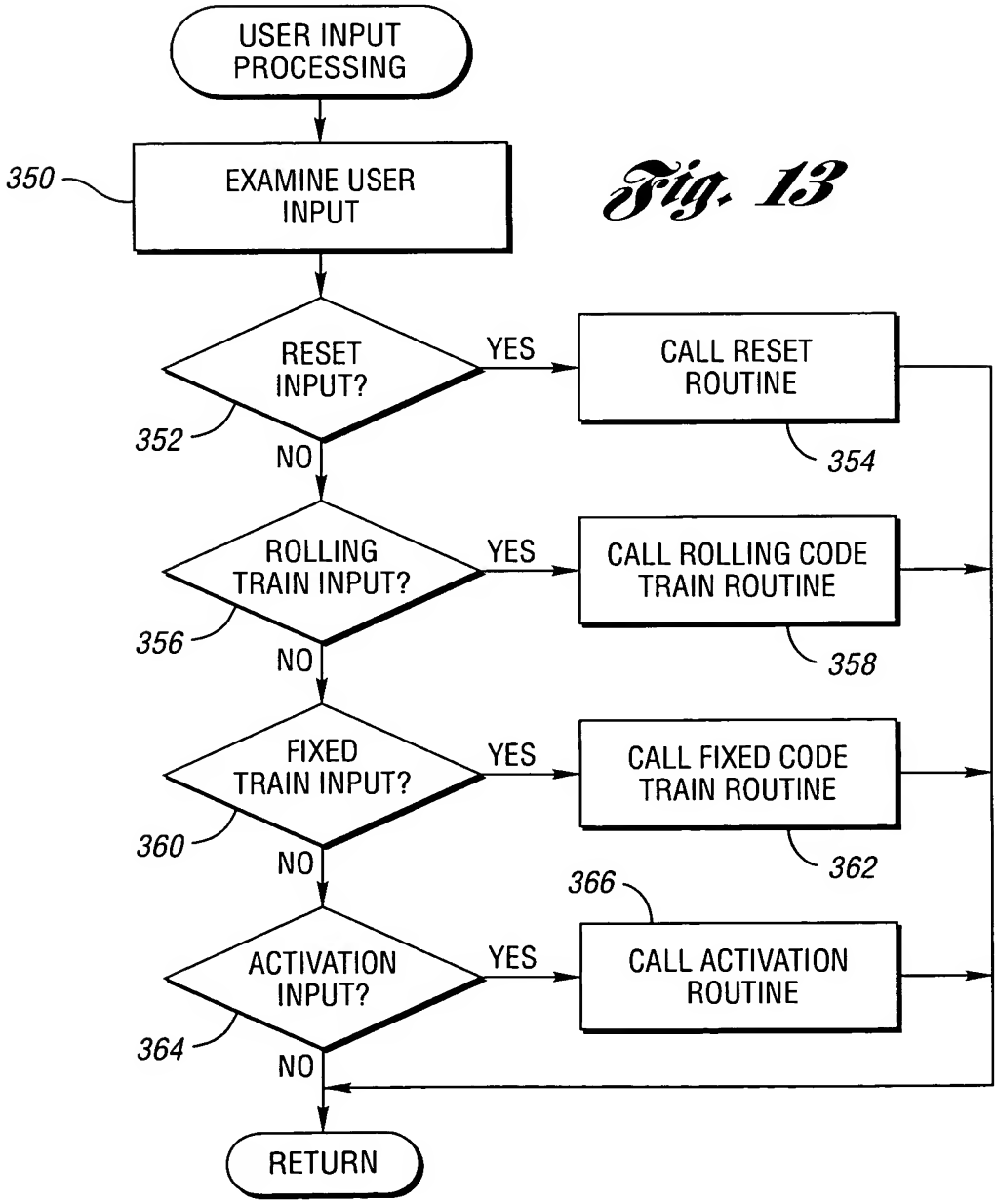

USER INPUT PROCESSING
350
EXAMINE USER INPUT
RESET INPUT?
352
YES
CALL RESET ROUTINE
354
NO
ROLLING TRAIN INPUT?
356
YES
CALL ROLLING CODE TRAIN ROUTINE
358
NO
FIXED TRAIN INPUT?
360
YES
CALL FIXED CODE TRAIN ROUTINE
362
NO
366
ACTIVATION INPUT?
364
YES
CALL ACTIVATION ROUTINE
NO
RETURN

Fig. 13

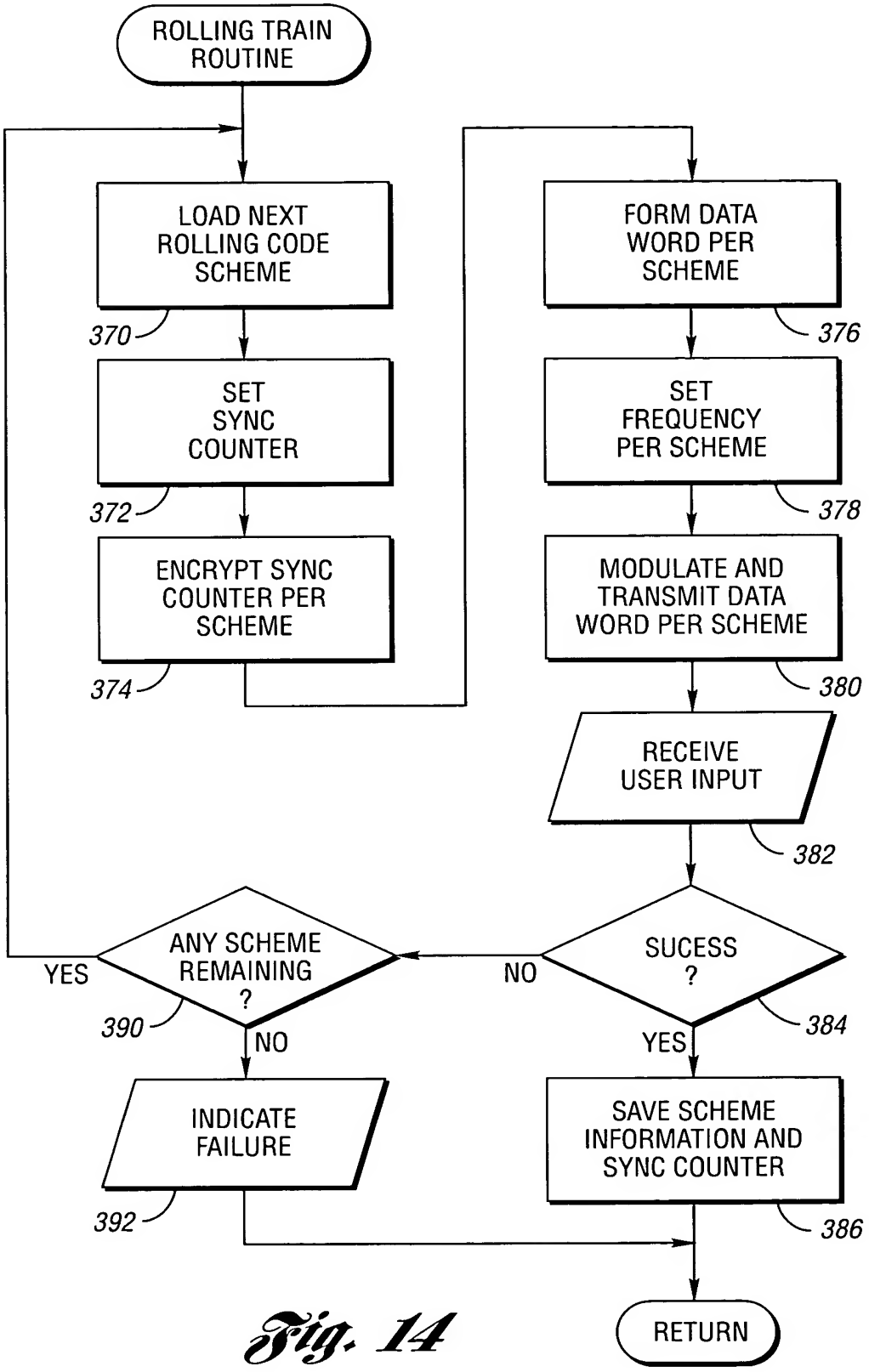

ROLLING TRAIN ROUTINE
LOAD NEXT ROLLING CODE SCHEME
370
SET SYNC COUNTER
372
ENCRYPT SYNC COUNTER PER SCHEME
374
FORM DATA WORD PER SCHEME
376
SET FREQUENCY PER SCHEME
378
MODULATE AND TRANSMIT DATA WORD PER SCHEME
380
RECEIVE USER INPUT
382
SUCESS ?
384
NO
YES
ANY SCHEME REMAINING ?
390
YES
NO
INDICATE FAILURE
392
SAVE SCHEME INFORMATION AND SYNC COUNTER
386
RETURN

Fig. 14

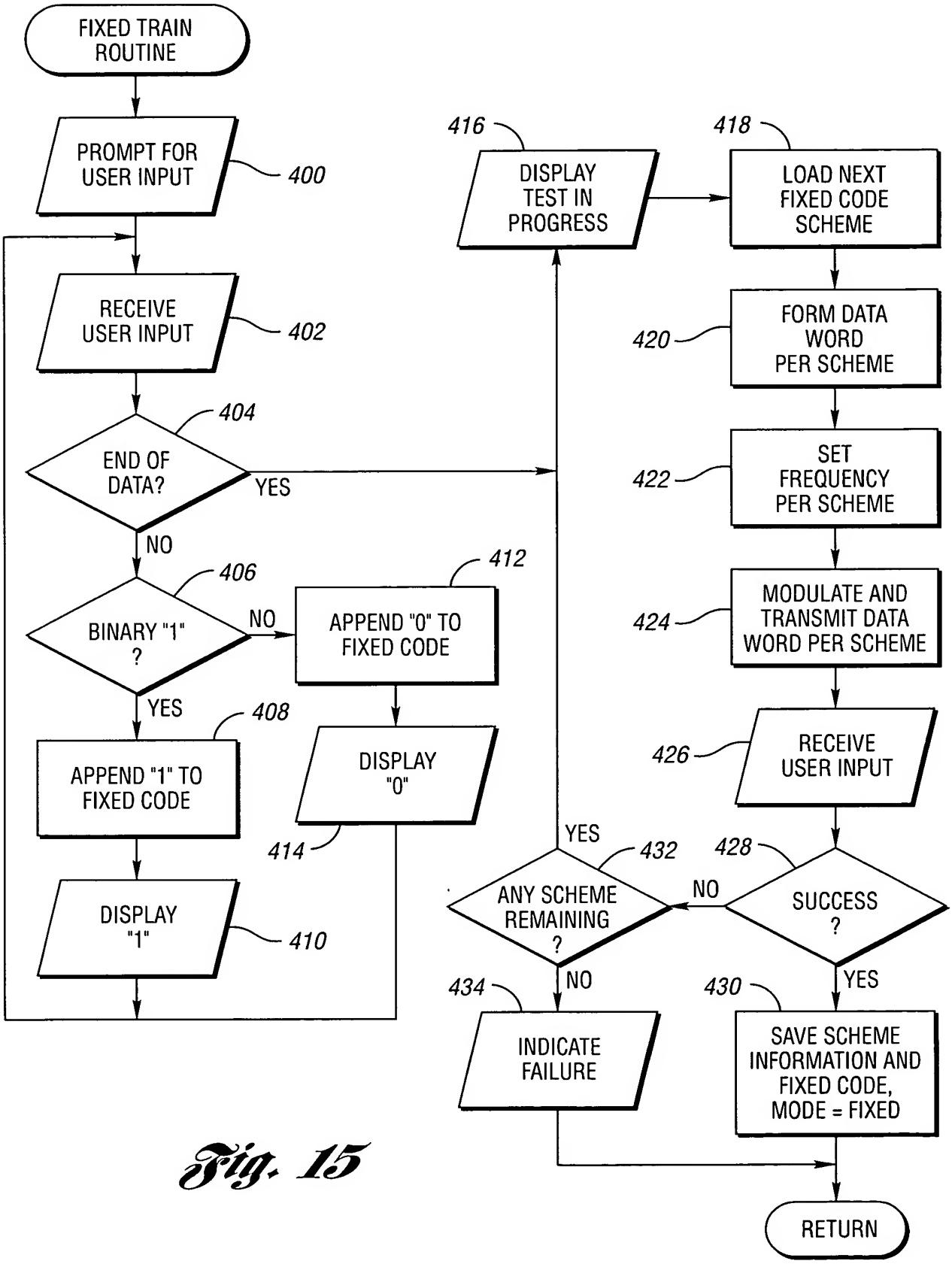

FIXED TRAIN ROUTINE
PROMPT FOR USER INPUT
400
RECEIVE USER INPUT
402
404
END OF DATA?
YES
NO
406
BINARY "1" ?
NO
412
APPEND "0" TO FIXED CODE
DISPLAY "0"
414
YES
408
APPEND "1" TO FIXED CODE
DISPLAY "1"
410
416
DISPLAY TEST IN PROGRESS
418
LOAD NEXT FIXED CODE SCHEME
420
FORM DATA WORD PER SCHEME
422
SET FREQUENCY PER SCHEME
424
MODULATE AND TRANSMIT DATA WORD PER SCHEME
426
RECEIVE USER INPUT
428
SUCCESS ?
NO
YES
432
ANY SCHEME REMAINING ?
YES
NO
434
INDICATE FAILURE
430
SAVE SCHEME INFORMATION AND FIXED CODE, MODE = FIXED
RETURN

Fig. 15

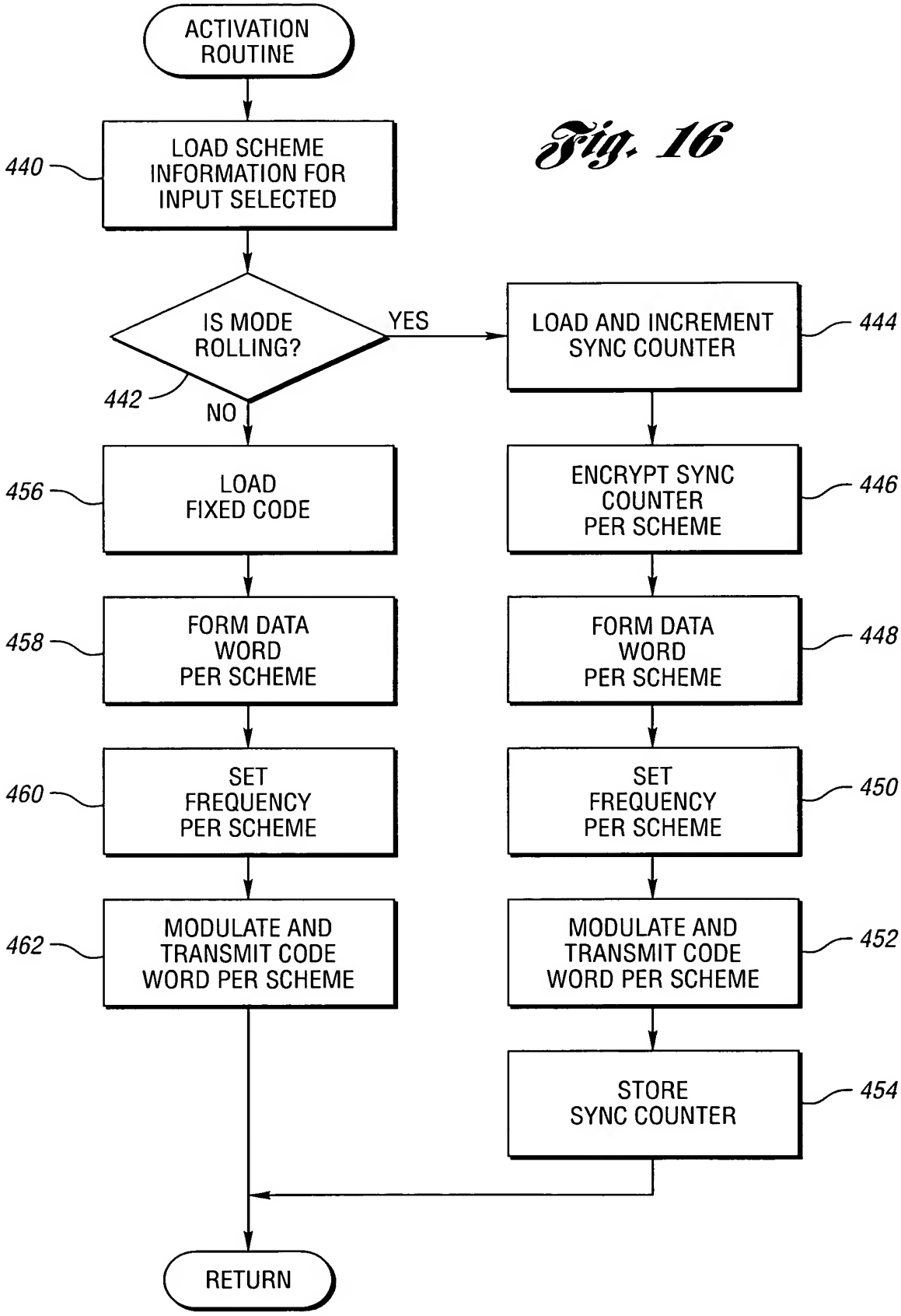

ACTIVATION ROUTINE
440
LOAD SCHEME INFORMATION FOR INPUT SELECTED
IS MODE ROLLING?
442
YES
NO
444
LOAD AND INCREMENT SYNC COUNTER
446
ENCRYPT SYNC COUNTER PER SCHEME
448
FORM DATA WORD PER SCHEME
450
SET FREQUENCY PER SCHEME
452
MODULATE AND TRANSMIT CODE WORD PER SCHEME
454
STORE SYNC COUNTER
456
LOAD FIXED CODE
458
FORM DATA WORD PER SCHEME
460
SET FREQUENCY PER SCHEME
462
MODULATE AND TRANSMIT CODE WORD PER SCHEME
RETURN

Fig. 16

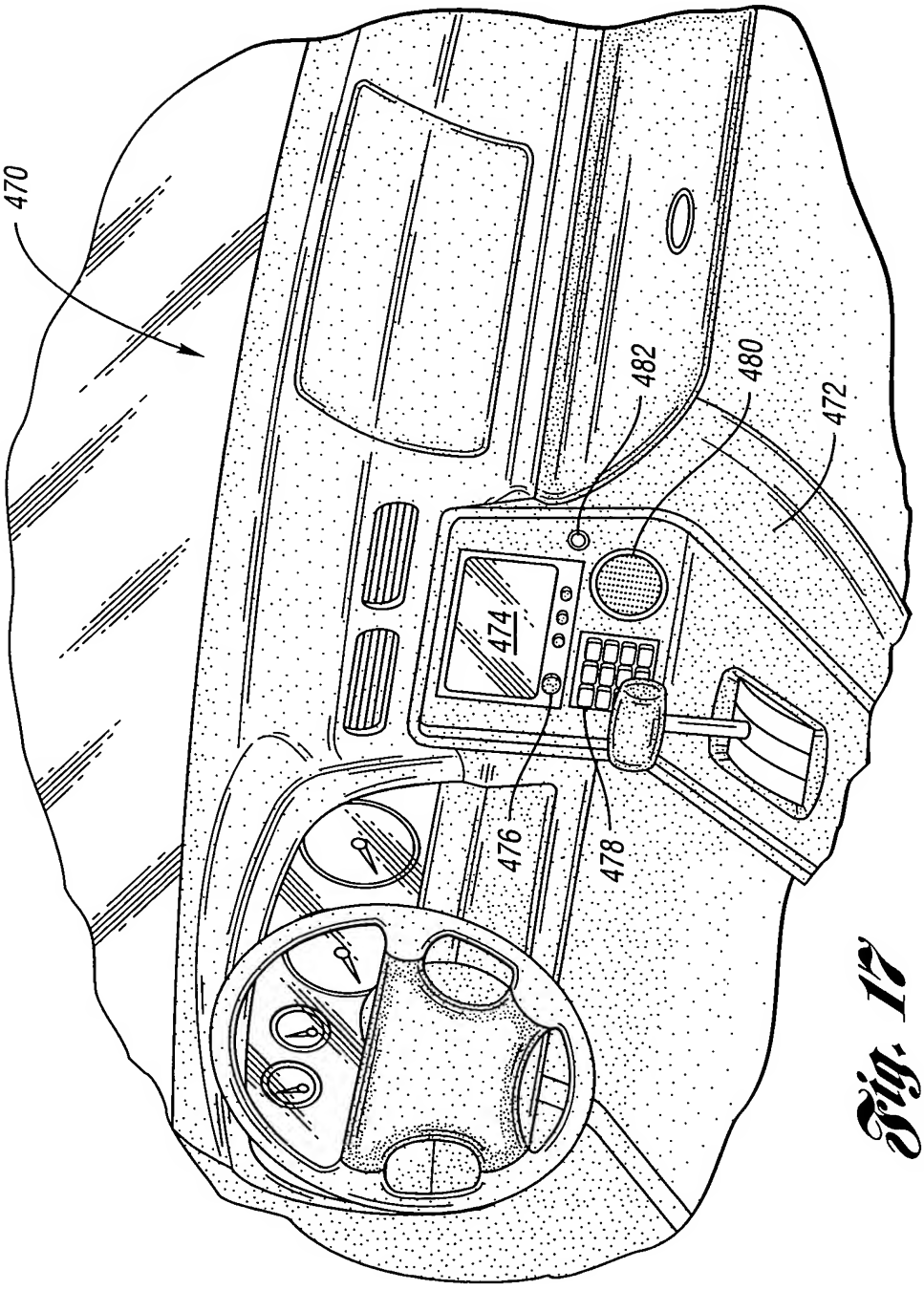


Fig. 17

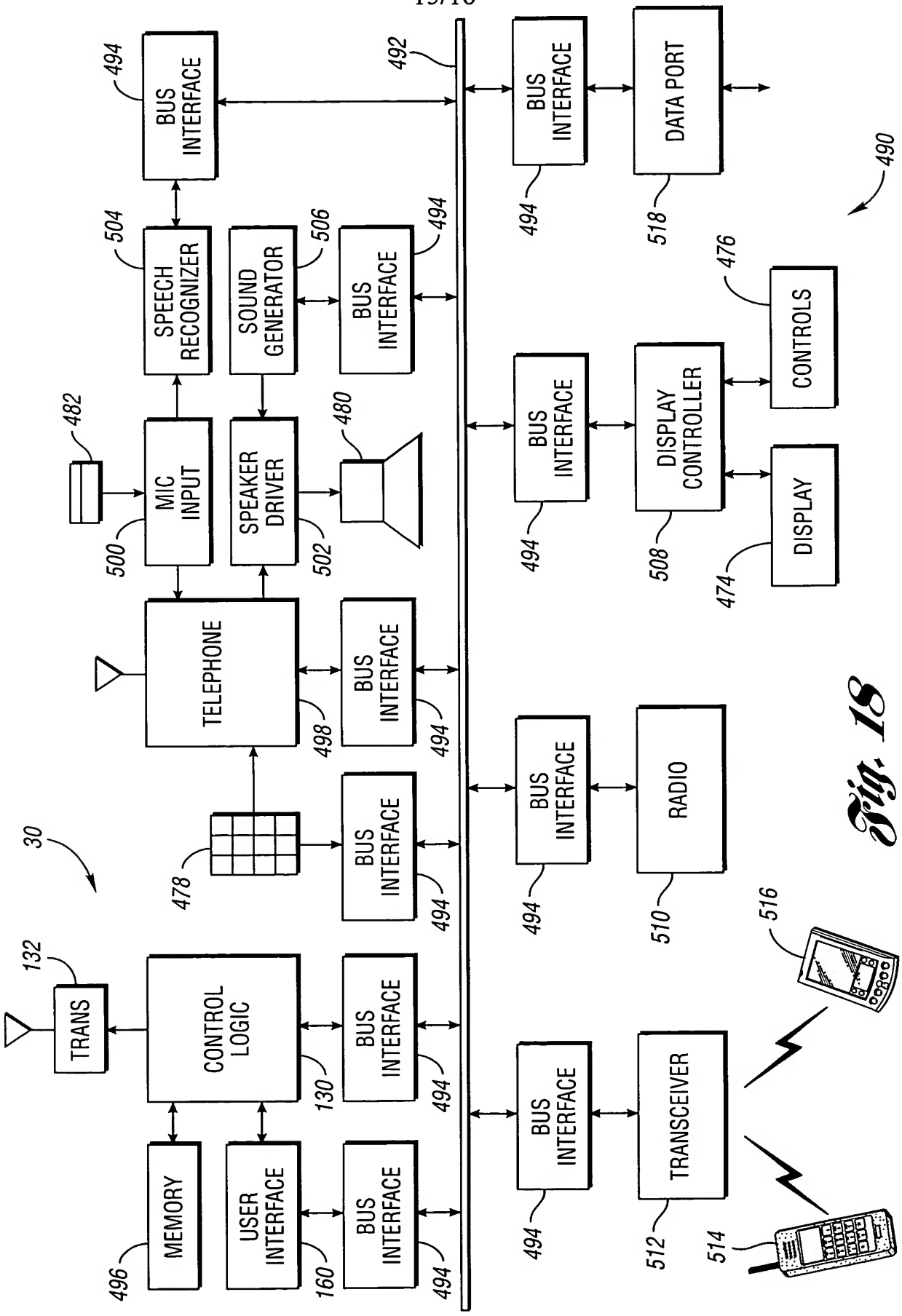

30
132
TRANS
CONTROL LOGIC
130
MEMORY
496
USER INTERFACE
160
478
482
MIC INPUT
500
SPEECH RECOGNIZER
504
SOUND GENERATOR
506
SPEAKER DRIVER
502
480
TELEPHONE
498
BUS INTERFACE
494
492
DATA PORT
518
490
CONTROLS
476
DISPLAY CONTROLLER
508
DISPLAY
474
RADIO
510
TRANSCEIVER
512
514
516

Fig. 18

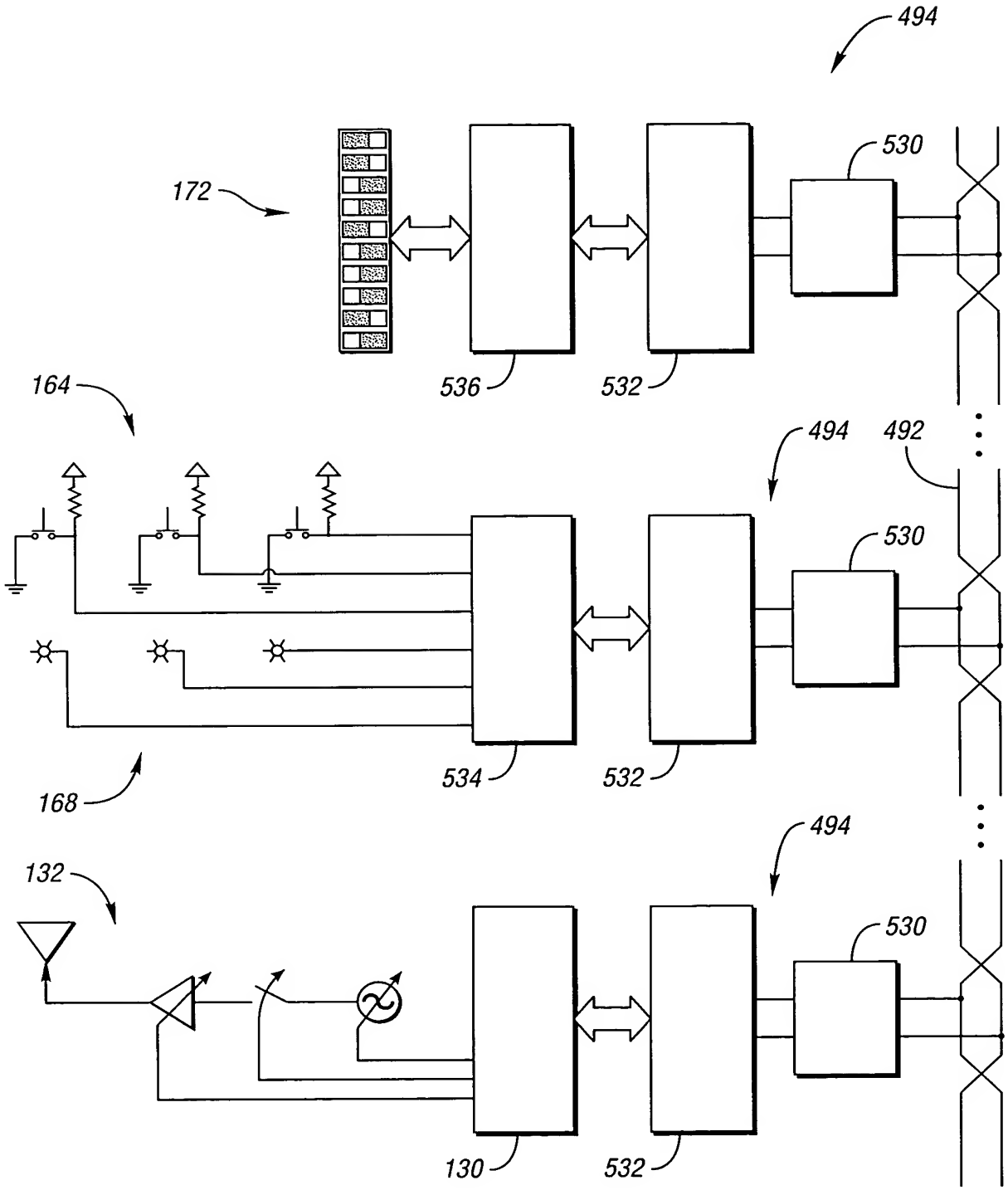

494
172
530
536
532
164
494
492
530
534
532
168
494
132
530
130
532

Fig. 19